(2) A space of less than 14 cubic meters (500 cubic feet) in volume must have a gooseneck vent of not less than 40 millimeters (1.5 inches) in diameter.

(b) Vent openings may not be located adjacent to possible sources of vapor ignition.

(c) A vessel of not more than 19.8 meters (65 feet) in length carrying not more than 12 passengers, with ventilation installations in accordance with ABYC Project H–32, ''Ventilation of Boats Using Diesel Fuel,'' will be considered as meeting the requirements of this section.

### § 182.480 Flammable vapor detection systems.

(a) A flammable vapor detection system required by § 182.410(c) must meet UL Standard 1110, ''Marine Combustible Gas Indicators,'' or be approved by an independent laboratory.

(b) Procedures for checking the proper operation of a flammable vapor detection system must be posted at the primary operating station. The system must be self-monitoring and include a ground fault indication alarm.

(c) A flammable vapor detection system must be operational for 30 seconds prior to engine startup and continue sensing the entire time the engine is running.

(d) A flammable vapor detection system must provide a visual and audible alarm at the operating station.

(e) A sensor must be located above the expected bilge water level in the following locations:

(1) The lowest part of a machinery space;

(2) The lowest part of a space containing a fuel tank when separate from the machinery space; and

(3) Any other location when required by the cognizant OCMI.

(f) A flammable vapor detection system must be installed so as to permit calibration in a vapor free atmosphere.

(g) Electrical connections, wiring, and components for a flammable vapor detection system must comply with part 183 of this chapter.

(h) An operation and maintenance manual for the flammable vapor detection system must be kept onboard.

## Subpart E—Bilge and Ballast Systems

### § 182.500 General.

(a) A vessel must be provided with a satisfactory arrangement for draining any watertight compartment, other than small buoyancy compartments, under all practicable conditions. Sluice valves are not permitted in watertight bulkheads.

(b) A vessel of not more than 19.8 meters (65 feet) in length carrying not more than 12 passengers may meet the requirements of ABYC Project H–22, ''DC Electric Bilge Pumps Operating Under 50 Volts,'' in lieu of the requirements of this subpart, provided that each watertight compartment, other than small buoyancy compartments and the compartment forward of the collision bulkhead, is provided with a means for dewatering.

(c) Special consideration may be given to vessels, such as high speed craft, which have a high degree of subdivision and utilize numerous small buoyancy compartments. Where the probability of flooding of the space is limited to external hull damage, compartment drainage may be omitted provided it can be shown by stability calculations, submitted to the cognizant OCMI, that the safety of the vessel will not be impaired.

### § 182.510 Bilge piping system.

(a) A vessel of at least 7.9 meters (26 feet) in length must be provided with individual bilge lines and bilge suctions for each watertight compartment, except that the space forward of the collision bulkhead need not be fitted with a bilge suction line when the arrangement of the vessel is such that ordinary leakage may be removed from this compartment by the use of a hand portable bilge pump or other equipment, and such equipment is provided.

(b) A bilge pipe in a vessel of not more than 19.8 meters (65 feet) in length must be not less than 25 millimeters (1 inch) nominal pipe size. A bilge pipe in a vessel of more than 19.8 meters (65 feet) in length must be not less than 40 millimeters (1.5 inches) nominal pipe size. A bilge suction must

be fitted with a suitable strainer having an open area not less than three times the area of the bilge pipe.

(c) Except when individual pumps are provided for separate spaces, individual bilge suction lines must be led to a central control point or manifold and provided with a stop valve at the control point or manifold and a check valve at some accessible point in the bilge line. A stop-check valve located at a control point or manifold will meet the requirements for both a stop valve and a check valve.

(d) A bilge pipe piercing the collision bulkhead must be fitted with a screw-down valve located on the forward side of the collision bulkhead and operable from the weather deck, or, if it is readily accessible under service conditions, a screw-down valve without a reach rod may be fitted to the bilge line on the after side of the collision bulkhead.

### § 182.520 Bilge pumps.

(a) A vessel must be provided with bilge pumps in accordance with Table 182.520(a). A second power pump is an acceptable alternative to a hand pump if it is supplied by a source of power independent of the first power bilge pump. Individual power pumps used for separate spaces are to be controlled from a central control point and must have a light or other visual means at the control point to indicate operation.

TABLE 182.520(A)

| Number of passengers | Length of vessel | Bilge pumps required | Min. capacity required per pump ltrs/min (gal/min) |
|---|---|---|---|
| Any number | More than 19.8 m (65 ft) | 2 fixed power pumps | 190 LPM (50 GPM). |
| More than 49 passengers and all ferry vessels. | Not more than 19.8 m (65 ft). | 1 fixed power pump and 1 portable hand pump | 95 LPM (25 GPM).<br>38 LPM (10 GPM). |
| Not more than 49 passengers (Other than ferry vessels). | 7.9 m, 26 feet up to 19.8 m (65 ft). | 1 fixed power pump and 1 portable hand pump or. | 38 LPM (10 GPM). |
| | | 1 fixed hand pump and | 38 LPM (10 GPM). |
| | | 1 portable hand pump | 19 LPM (5 GPM). |
| | Less than 7.9 m (26 ft) | 1 portable hand pump | 19 LPM (5 GPM). |

(b) A portable hand bilge pump must be:

(1) Capable of pumping water, but not necessarily simultaneously, from all watertight compartments; and

(2) Provided with suitable suction hose capable of reaching the bilge of each watertight compartment and discharging overboard.

(c) Each fixed power bilge pump must be self priming. It may be driven off the main engine or other source of power. It must be permanently connected to the bilge manifold and may also be connected to the fire main. If of sufficient capacity, a power bilge pump may also serve as a fire pump.

(d) Where two fixed power bilge pumps are installed, they must be driven by different sources of power. If one pump is driven off the main engine in a single propulsion engine installation, the other must be independently driven. In a twin propulsion engine installation, each pump may be driven off a different propulsion engine.

(e) A submersible electric bilge pump may be used as a power bilge pump required by Table 182.520(a) only on a vessel of not more than 19.8 meters (65 feet) in length carrying not more than 49 passengers, other than a ferry, provided that:

(1) The pump is listed by Underwriters' Laboratories Inc. or another independent laboratory;

(2) The pump is used to dewater not more than one watertight compartment;

(3) The pump is permanently mounted;

(4) The pump is equipped with a strainer that can be readily inspected and cleaned without removal;

(5) The pump discharge line is suitably supported;

(6) The opening in the hull for the pump discharge is placed as high above the waterline as possible;